

APPLICANTS: Choi et al.
SERIAL NO.: 09/954,515
FILED: September 17, 2001
FOR: PROCESS FOR FORMING ELECTRODES

REMARKS

Claims 18-24 and 26-32 were pending in this application. Claims 29-32 have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. Specifically, the examiner alleges that “the upper limit of less than about 30 nm” is not specifically recited in the specification.

Claims 18-24 and 26-32 have been rejected under 35 USC 103(a) as being unpatentable over Fukuyoshi et al. (U.S. Patent No. 5,667,853). Claim 28 has been rejected under 35 USC 103(a) as being unpatentable over Fukuyoshi et al. in view of Yatabe et al. (U.S. Patent No. 4,234,654). Claim 31 has been rejected under 35 USC 103(a) being unpatentable over Fukuyoshi et al. in view Tanitsu et al. (U.S. PatentNo. 5,520,952).

Claim 18 is amended herein. As a result, claims 18-24, and 26-32 are now pending in this application.

Rejection Under 35 U.S.C. § 112 first paragraph

Claims 29-32 are rejected under 35 U.S.C. § 112, first paragraph, as failing to particularly comply with the written description requirement. Specifically, the examiner alleges that the claims contain subject matter that was not described in such away in the specification as to reasonably convey to one skilled in the relevant art that the inventors had possession of the claimed invention. The Examiner alleges that the upper limit of less than about 30 nm is not specifically recited in the specification.

As described in the specification in paragraph [0023] the “thickness of the top layer is desirably in the range of about 20 to about 100 nm.” Applicants submit that the range of “from about 20 nm to less than about 30 nm” is inherently disclosed in the range cited to in paragraph [0023]. Additionally, to the extent claims are rejected such that the claimed range includes one or

more points in a range disclosed in a prior art reference, it follows that amending the claim to cover a range that does not contain the points recited in the prior art reference should be a valid amendment. As a result, in light of the disclosure of paragraph [0023], Applicants submit that claim 29 complies with the requirements of 35 U.S.C. § 112, first paragraph.

For at least these reasons, Applicants submit that claim 29 and claims 30-32, which depend therefrom, claim subject matter that was in possession of the inventors. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 U.S.C. § 112, first paragraph rejections.

Claim Rejections

Amended independent claim 18 recites a substantially transparent electrode assembly comprising a substrate, a high index layer formed on the substrate, a conductive layer formed on the high index layer, a high index top layer having a conductivity ranging from about 100 ohms/square to about 400 ohms/square and a thickness ranging from about 20 nm to about 100 nm formed on the conductive layer, at least the top layer and the conductive layer being patterned so as to divide the conductive layer into a plurality of discrete electrodes, and a layer of silica disposed on the substrate, the layer of silica in substantially continuous contact with the substrate.

Independent claim 29 recites a substantially transparent electrode assembly comprising a substrate, a high index layer formed on the substrate, a conductive layer formed on the high index layer, a high index top layer having a conductivity ranging from about 100 ohms/square to about 400 ohms/square and a thickness ranging from about 20 nm to less than about 30 nm formed on the conductive layer, wherein the thickness of the high index top layer is about 20 nm to less than about 30 nm, at least the top layer and the conductive layer being patterned so as to divide the conductive layer into a plurality of discrete electrodes.

Independent claim 18 is patentable over Fukuyoshi et al., the CERAC technical publication and Yatabe et al. because none of these references, either alone or in combination, shows or suggests a substantially transparent electrode assembly including a high index top layer having a conductivity ranging from about 100 ohms/square to about 400 ohms/square with a layer of silica disposed on the substrate, the layer of silica in substantially continuous contact with the substrate. In addition, a substantially transparent electrode assembly wherein the thickness of the high index top layer is about 20 nm to less than about 30 nm as recited in claim 29 is not disclosed in the cited references.

Furthermore, none of CERAC, Fukuyoshi et al. or Yatabe et al. disclose or suggest using a layer of silica for promoting adhesion between the high index layer and the substrate, the layer of silica in substantially continuous contact with the substrate. In fact, Fukuyoshi et al. discloses using a silica coating such that the coating is only in intermittent contact with the substrate surface. As shown in Figure 2 of Fukuyoshi et al., depicted by the Examiner on page 4 of the office action, the silica layer 21 is discontinuous, only contacting the substrate at small alternating regions. In contrast, the claimed approach requires a layer of silica disposed on the substrate that is in substantially continuous contact with the substrate. This silica layer promotes adhesion of the high index layer to the substrate or protects the other side of the substrate from moisture. The cited references do not teach or suggest the importance of adhesion promotion in general or the specific goal of adhering the high index layer to the substrate. Using a silica layer in substantially continuous contact with the substrate is not taught by Fukuyoshi et al. As such, the cited reference fails to teach the present invention.

The conductivity ranges and layer thicknesses (claim 18, claims 29-32) recited by Applicants further distinguish the claimed invention from the prior art. "While the measurement of a physical

property may not of itself impart patentability to otherwise unpatentable claims, when the measured property serves to point up the distinction from the prior art, or advantages over the prior art, that property is relevant to patentability, and its numerical parameters can not only add precision to the claims but also may considered, along with all of the evidence, in determination of patentability.” In re Glaug, 62 U.S.P.Q.2d 1151, 1155 (Fed. Cir. 2002). Applicant’s experimentation with temperature, fabrication techniques to achieve desired sheet resistances and conductivity levels, and the use of coatings to promote adhesion between the substrate and the lower high index layer, as evidenced by the claims, further differentiate the present invention from the cited prior art. These factors support a determination of patentability of the present invention and a finding of non-obviousness over the cited references.

Fukuyoshi et al. disclose a multilayered conductive film including a silver-based layer formed of a silver-based metallic material, and first and second transparent oxide layers being independently formed of a compound oxide material of indium oxide. As the Examiner admits, Fukuyoshi et al. fail to teach that the transparent oxide top layer has a conductivity ranging from about 100 ohms/square to about 400 ohms/square.

Instead, the Examiner states that the CERAC technical publication “teaches that high conductivity is balanced against high transmission in the visible light region, and that indium tin oxide must have a conductivity...or sheet resistance of greater than 100 ohms/square in order to obtain visible region transmission near 90%.” The Examiner states that it would have been the result of routine experimentation for one of ordinary skill in the art to use indium tin oxide with a conductivity ranging from about 100 ohms/square to about 400 ohms/square as the transparent oxide top layer of Fukuyoshi et al. However, the present specification states that the preferred materials and processes for forming the top layer are the same as those for forming the insulating

layer, except that the condition used to deposit the top layer should be varied so as to give the top layer substantial conductivity. See specification page 8, lines 1-4.

In addition, the CERAC technical publication discloses that the “optical and electronic properties of ITO films are highly dependent on the deposition parameters and the starting composition of evaporation material used.” Therefore, there is no suggestion or motivation within Fukuyoshi et al. or the CERAC publication to vary the condition used to deposit the high index top layer and the high index layer in the way suggested by the Examiner to make the present claimed invention. However, even if the cited references disclose what the Examiner claims they disclose, none of the references teach or motivate one skilled in the art to tailor the deposition process to achieve the sheet resistance or conductivity ranges required by the invention. In essence, none of the cited references provide the motivation for one skilled in the art to obtain the specific conductivity ranges recited in the claims.

With respect to claim 29, the examiner notes on page 7 of the official action that Fukuyoshi fails to teach a top transparent layer having a thickness range of 20 nm to less than about 30 nm. Suggesting that since Fukuyoshi et al. does not teach away from using a lower thickness value fails to establish a prima facie basis for an obvious rejection. Fukuyoshi et al. does not teach the specific range claimed, nor does Fukuyoshi et al. teach the materials and techniques disclosed in the present application to fabricate a high index top layer using the thickness range recited in claim 29. As a result, Applicants request that the examiner withdraw the rejection relating to claim 29 and the claims that depend from it.

For the reasons set forth above, Applicants submit that Fukuyoshi et al., CERAC, or Yatabe et al., either alone or in combination, fail to anticipate or render obvious the claimed invention. Accordingly, claims 18 and 29 should be passed to allowance. Dependent claims 19-24 and 26-30,

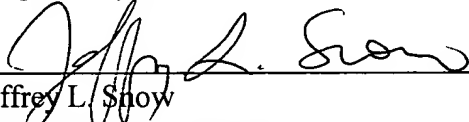
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and 31-32, which depend directly from independent claims 18 or 29, contain all of the limitations of the independent claim from which they depend. Dependent claims 30-32 contain additional limitations that further delineate the invention. As a result, all of the pending dependent claims are patentable over Fukuyoshi et al., the CERAC publication and Yatabe et al., either alone or in combination, for at least the same reasons set forth above with respect to claims 18 and claims 29-32.

Enclosed is a Petition for a Two Month Extension of Time along with the required fee.

Applicants submit that all of the claims are now in condition for allowance, which action is requested. Please apply any charges or credits to Deposit Account No. 50-1721.

Respectfully submitted,



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